

CLAIMS

1. A method of manufacturing a semiconductor device comprising the steps of:

5 forming an insulating film on a surface of a semiconductor element or a circuit wiring board having electrodes on the surface thereof;

forming openings in the insulating film by patterning the insulating film and then removing portions of the insulating film above the electrodes;

10 supplying a first metal into the openings; heating the first metal to melt and coagulate the first metal;

supplying a second metal into the openings on the first metal;

15 heating the first metal and the second metal to melt and coagulate the first metal and the second metal; and

removing the insulating film.

2. A method of manufacturing a semiconductor device according to claim 1, wherein the first metal and the second metal are supplied into the openings by an electrolytic plating method or a vapor-deposition method.

3. A method of manufacturing a semiconductor device according to claim 1, wherein the first metal has a characteristic in which a volume thereof is increased when it is heated to be molten and coagulated.

4. A method of manufacturing a semiconductor device according to claim 3, wherein the first metal contains as a component thereof Bi or an alloy including Bi as a primary component.

5. A method of manufacturing a semiconductor device according to claim 4, wherein a content of Bi in the first metal is in the range from 20 to 70 wt% of the sum of the first metal and the second metal.

35 6. A method of manufacturing a semiconductor device according to claim 1, wherein the second metal contains as a component thereof at least one of Sn, Ag,

In, Cu, Zn and Sb.

5        7.    A method of manufacturing a semiconductor device according to claim 1, wherein the second metal is formed to such a height that it protrudes from the opening.

      8.    A method of manufacturing a semiconductor device according to claim 1, wherein the insulating film comprises a dry film resist.